

## 6-07 PAINTING

### 6-07.1 Description

This Work consists of surface preparation, containing, testing and disposing of surface preparation debris, furnishing and applying paint, shielding adjacent areas from unwanted paint, and cleaning up after painting is completed. The Work shall comply with all requirements of the Plans, these Specifications, and the Engineer.

### 6-07.2 Materials

Paint materials shall comply with the requirements in Section 9-08.

Material used for field abrasive blasting shall meet Military Specification MIL-A-22262B(SH) as listed on QPL-22262-28 as maintained by the Department of the Navy. The Contractor shall provide the Engineer with certified test results from the abrasive blast media manufacturer showing that the abrasive blast material meets the Military Specification. In addition, the Contractor shall blend an additive with the abrasive blast media that renders the blast residual to a non-hazardous waste condition.

### 6-07.3 Construction Requirements

#### 6-07.3(1) Painting New Steel Structures

All material classified as structural steel shall be painted with a shop applied, inorganic zinc silicate primer, followed by a field applied 2 coat paint system after field erection, cleaning, and spot priming have been completed. Except as otherwise specified, all steel surfaces shall be painted with 3 coats of paint. Steel surfaces embedded in concrete and faying (contact) surfaces of bolted connections (including all surfaces internal to the connection and all filler plates) shall receive the prime coat only. Stainless steel surfaces shall not be painted. Galvanized surfaces shall not be painted unless specified in the Plans or Special Provisions. Painting of galvanized surfaces, if so specified, shall be in accordance with Section 6-07.3(4).

The painting system shall consist of 3 coats as follows:

	<b>Method A</b>	<b>Method B</b>
Primer Coat	inorganic zinc	Inorganic zinc
2nd Coat	epoxy	B-11-99 Field applied
3rd Coat	aliphatic urethane	C-11-99 Field applied

Once a paint system has been selected, that system shall be used throughout the Structure.

Terminology used herein is in accordance with the definitions used in Volume 2, Systems and Specifications of the SSPC Steel Structures Painting Manual, current edition.

Prior to any coating materials being utilized, the Contractor shall submit the product data sheets to the Engineer for approval. The product data sheets shall include all application instructions including the mixing and thinning directions, the recommended spray nozzles and pressures, the minimum and maximum drying time between coats, friction coefficient of the faying surface, restrictions on temperature and humidity, and the repair procedures. In addition, the Contractor shall submit to the Engineer for approval an abrasive blast procedure. The procedure shall include the type of equipment and abrasive media to be used.

Paint formulations to be used on faying surfaces shall be Class B coatings with a mean slip coefficient not less than 0.50. The slip coefficient shall be determined by testing in accordance with “Test Method to Determine the Slip Coefficient for Coatings Used in Bolted Joints” as adopted by the Research Council on Structural Connections. Test results and the paint manufacturer’s Certificate of Compliance shall be submitted to the Engineer for approval with the structural steel shop drawings.

For Contracts in which more than 20,000-pounds of steel are to be painted, the manufacturer of the paint system shall have a technical representative present at the job site for the first day of painting. After the first day of painting the technical representative shall remain available for contact in the event of technical difficulties in applying the paint system.

During fabrication and shop painting, the Contractor shall provide access meeting the approval of the Engineer to permit inspection of the steel. The access shall not mar or damage any freshly painted surfaces.

The Contractor shall select a primer from one of the approved products listed in the Qualified Products List. The field applied primer, the second coat and the third coat shall all be selected from the same manufacturer from one of the approved coating systems listed in the Qualified Products List.

The color for the second coat shall be a contrasting color to the third coat. The color for the third coat shall be as specified in the Special Provisions.

Steel surfaces shall be:

For Method A:

1. Greater than 45°F and at least 5°F above the dew point, and
2. Less than 115°F.

For Method B:

1. Greater than 35°F and
2. Less than 115°F

#### **6-07.3(1)A Preparation for Shop Coating**

A roughened surface profile shall be provided by an abrasive blasting procedure as approved by the Engineer. The profile shall be 1-mil minimum or per the paint manufacturer’s recommendation, whichever is greater. The steel surfaces shall be cleaned to a near white condition as per SSPC-SP10.

After being thoroughly cleaned by abrasive blasting as specified above, all structural steel shall be primed within the same working day on which abrasive blasting takes place, and before any rust forms, by spraying with a full coat of inorganic zinc silicate paint. The Contractor shall not begin painting until receiving the Engineer’s approval of the prepared surface. High strength field bolts need not be painted before erection.

Care shall be taken to protect freshly coated surfaces from subsequent abrasive blast cleaning operations. Primed surfaces which are damaged by abrasive blasting shall be thoroughly wire brushed or, if visible rust occurs, re-blasted to a near-white (SSPC-SP10) condition. The wire brushed or abrasive blast cleaned surfaces shall be vacuumed and re-primed by spraying.

**6-07.3(1)B Mixing and Thinning the Shop and Field Coatings**

The coating shall be mixed with a high shear mixer in accordance with the manufacturer's written recommendations to a smooth, lump-free consistency. Paddle mixers or paint shakers are not allowed. Mixing shall be done, to the extent possible, in the original containers and shall be continued until all of the metallic powder or pigment is in suspension. The mixed coating shall be kept under continuous agitation up to and during the time of application.

In general, the coatings are supplied for use without requiring thinning. If it is necessary to thin the coating for proper application in cool weather, or to obtain better coverage of the urethane coat, the thinning shall be done in accordance with the manufacturer's written recommendations.

**6-07.3(1)C Applying The Shop Coating**

After the surface to be coated has been cleaned, and has received the Engineer's approval, the primer coat shall be applied so as to produce a uniform, even coating that has fully bonded with the metal.

The coatings shall be applied with the spray nozzles and pressures recommended by the manufacturer of the paint system, so as to attain the film thicknesses specified.

The top surfaces of the top flanges of the steel girders shall not be primed until the welded shear connectors are placed, unless the welded shear connectors are to be placed in the field. Welded shear connectors are not required to be painted except for the weld area.

If the welded shear connectors are to be placed in the field, the area to be welded shall be cleaned of primer by abrasive grinding just prior to welding. After welding, the ground area and the weld shall be cleaned and primed. Surfaces which are inaccessible for painting after erection shall be painted with the 2 field coats of paint before erection.

Dry film thickness measurements will be made in accordance with Section 6-07.3(5).

**6-07.3(1)D Field Coating After Erection**

When the erection Work has been completed, including all connections and the straightening of any bent metal, all steel surfaces and bolts shall be prepared for painting. All adhering scale, dirt, grease, form oil, or other foreign matter shall be removed by appropriate means and all rusted or uncoated areas including the bolts, nuts, washers and splice plates shall be abrasive blasted to a near-white (SSPC-SP10) condition. All uncoated areas shall be field primed with an organic zinc paint coating selected from the same approved coating system and paint manufacturer as the other coatings for the Structure.

After all field priming has been completed the surfaces shall be prepared to receive the final 2 field coats. The intermediate coat shall be mixed and applied per the manufacturer's written recommendations. The top coat shall also be mixed and applied per the manufacturer's written recommendations. The minimum drying time between coats shall be as shown in the approved product data sheets, but not less than 12-hours. Depending on site conditions, additional time may be required for proper curing before applying succeeding coats. The Contractor shall determine if the coating has cured sufficiently for proper application of succeeding coats. The maximum time between coats shall be in accordance with the manufacturer's written recommendations. If the maximum time between coats is exceeded, all newly coated surfaces shall be completely blast-cleaned again to a near white finish (SSPC-SP10) and re-coated at no additional cost to the Contracting Agency.

Dry film thickness measurements will be made in accordance with Section 6-07.3(5).

Temporary attachments or supports for scaffolding or forms shall not damage the coating system. All paint damage that occurs shall be repaired in accordance with the manufacturer's written recommendations and as follows. On bare areas or areas of insufficient primer thickness, the repair shall include the application of the field applied organic zinc primer system, and the final 2 coats of the Method A or Method B paint system. On areas where the primer is at least equal to the minimum required dry film thickness, the repair shall include the application of the final 2 coats of the Method A or Method B paint system. If any abrasive blast cleaning is required in the field it shall be done using an abrasive conforming to [Section 6-07.2](#).

### **6-07.3(2) Repainting Existing Steel Structures**

Unless otherwise provided, maintenance painting includes cleaning and painting all metal surfaces of an existing bridge. These include all metal surfaces that do not touch other metal, wooden floor or truss members, concrete or stone masonry, or other surfaces. Cleaning means removing rust, scale, unsound paint, dirt, grease, and other foreign matter. The Contractor shall clean and paint all exposed metal surfaces that may rust.

The Contractor shall abrasive blast all rust spots in accordance with the SSPC-SP6 Specifications for commercial blast cleaning. The edges of cleaned areas shall show no red or yellow rust. The edges of sound paint shall be feathered smooth. After abrasive blasting, the Contractor shall remove all loose rust, dirt, sand, and dust before painting.

### **6-07.3(2)A Bridge Cleaning**

#### **Bird Guano**

Bird guano shall be completely removed prior to any other cleaning. All workers involved with bird guano removal operations shall be protected from absorption, inhalation, or ingestion of bird guano particles by wearing protective clothing as specified in the Contractor's Lead Health Protection Program (LHPP). Bird guano shall be removed in the dry to the extent possible. Following dry removal, the Contractor shall apply a 5.25-percent sodium hypochlorite solution to the remaining bird guano, followed by hand scrubbing, and pressure flushing as specified. The sodium hypochlorite solution shall not be used as an additive to the water used for pressure flushing, but shall be directly applied onto the areas of remaining bird guano. The bird guano shall be collected in a containment system approved by the Engineer and shall not enter any waterway or the surrounding environment. All bird guano shall be removed and disposed of at a land disposal site approved by the Engineer. The Contractor shall provide the Engineer with 1 copy of the disposal receipt, which shall include a description of the material disposed of.

#### **Fungicide Treatment**

The Contractor shall treat all areas of fungus growth. When treating areas of fungus growth the Contractor shall use special cleaning methods before beginning general surface cleaning operations. The Contractor shall apply a 5.25-percent sodium hypochlorite solution to the bridge in fungus infested areas for a period recommended by the solution manufacturer or as specified by the Engineer. The sodium hypochlorite solution shall not be used as an additive to the water used for pressure flushing, but shall be directly applied onto the areas of fungus growth.

**General Cleaning and Surface Preparation**

Following fungicide treatment and removal of the bird guano, all steel surfaces to be painted shall be cleaned by either pressure flushing or sweep blasting. The cleaning process shall remove dirt, loose paint, and other material from the steel surfaces to be painted, but shall not remove well bonded paint. The Contractor shall follow the construction requirements of the cleaning method selected.

Spot abrasive blasting of all rusted steel surfaces and unbonded paint shall follow the pressure flushing or sweep blasting in areas designated by the Engineer. The Contractor shall hand clean, to the satisfaction of the Engineer, all surfaces inaccessible to cleaning with pressure flushing and sweep blasting equipment.

Prior to the application of paint the Contractor shall clean the bridge deck surface for the purpose of dust control.

**Pressure Flushing**

When pressure flushing is used, it shall be done with clean, fresh water only. No detergents, bleach, or other cleaning agents shall be employed. The pressure flushing equipment shall produce (at the nozzle) at least 3,000-psi with a discharge of at least 4-gpm. The nozzle shall have a 25-degree tip and shall be held no more than 9-inches from the surface being washed. The use of a rotating tip nozzle may be allowed provided:

1. The Contractor requests its use in writing.
2. The pressure equipment shall produce at least 3,500-psi at the nozzle.
3. There shall be no additional cost to the Contracting Agency
4. The use of the nozzle has been approved in writing by the Engineer.

The Contractor may pressure flush other portions of the bridge for safety purposes, at no additional expense to the Contracting Agency.

All wash water and debris from pressure flushing shall be filtered through a filter fabric capable of collecting all loose debris and particles. A polypropylene, non-woven, needle-punched geotextile or equivalent shall be used as the filter fabric. The fabric shall have the following properties:

Grab tensile (ASTM D4632):	100 lbs. Min.
Apparent opening size (ASTM D4751):	#100 US Sieve
Permittivity (ASTM D4491):	1.0 sec - 1 or better

The fabric shall be supported underneath the Structure to hold the contained material and shall be cleaned at intervals frequent enough to prevent clogging, overflow, or collapse. The debris obtained from the pressure water flushing operation shall be collected and tested in accordance with Section 6-07.3(2)C, and disposed off site at a waste disposal facility approved by the Engineer.

**Sweep Blasting and Spot Abrasive Blasting**

Sweep or spot abrasive blasting shall not begin until the containment system specified in Section 6-07.3(2)B is in place. No sweep or spot abrasive blasting shall begin until the surfaces are thoroughly dry. The abrasives to be used shall conform to Section 6-07.2. Sweep and spot abrasive blasting shall be done in such a manner that adjacent areas of Work that have been partially or entirely completed are protected from damage.

Sweep blasting shall comply with the SSPC-SP 7 requirements. Spot abrasive blasting shall comply with the SSPC-SP 6 requirements.



The abrasive blasters shall be equipped with automatic shutoffs that operate by releasing the trigger mechanism. All abrasive blasting shall be directed towards the bridge center and away from the outboard sides, to facilitate catching all the containment waste. After abrasive blasting, all rust debris, dirt, abrasive and paint residue, and dust shall be completely removed before paint is applied.

#### **6.07.3(2)B Containment of Abrasive Blasting**

The Contractor shall protect the surrounding environment from all debris or damage resulting from the Contractor's operation. The Contractor shall take all measures necessary to contain and recover debris generated during cleaning, preparation, and coating operations. The Contractor shall design, construct, and maintain containment systems for abrasive blasting operations in accordance with best management practices. Disposal of the collected materials shall be as specified in the Section 6-07.3(2)C.

1. At the pre-construction conference, the Contractor shall submit a written Containment System Plan, including Working Drawings as appropriate, describing the methods for waste containment, collection, and disposal, to the Engineer for approval. The Contractor shall prepare and submit the Containment System Plan in accordance with Section 6-01.9. The Contractor shall not begin any abrasive blasting operations until receiving the Engineer's approval of the Containment System Plan.
2. The containment system shall not cause any damage to the existing Structure.
3. The Contractor shall enclose all portions of the bridge to be blasted by sweep blasting or spot abrasive blasting as specified. The enclosed area shall consist of that portion below the area to be blasted, and extending up the sides of the Structure to above the top of the Structure. The enclosed length of each bridge span (defined as pier to pier) shall not exceed  $\frac{1}{2}$  the length of the span. The containment system may remain open at the top.
4. The containment system shall be capable of being removed rapidly in case of high winds. Abrasive blasting operations shall cease if wind conditions prevent capture of blast rebound and paint residue by the containment system. If there is a question on wind conditions, the Engineer will make the final determination on whether blasting operations shall cease and the containment system removed.
5. The containment system shall not endanger the safety and health of the workers. Access to the containment system shall be designed to prevent any confined materials from escaping.
6. To prevent the weight of the confined materials from causing failure to the containment system, all confined materials shall be collected and secured in sealed containers at the end of each shift daily, at a minimum. No confined materials shall escape during transfer from the containment systems to the sealable containers. All confined materials within the containment system shall be removed and secured in sealable containers prior to relocation or removal of the containment system.
7. If failure to the containment system occurs or if signs of failure to the containment system are present, the Contractor shall stop Work immediately. Work shall not resume until the failure has been corrected to the satisfaction of the Engineer.

8. The containment structure shall not be removed and painting operations shall not commence until all abrasive blasted surfaces have been inspected and approved for painting by the Engineer.
9. If the containment structure is removed after the abrasive blasting operation and before the coating operation, the Contractor shall install a drip tarp to prevent spillage of paint onto the waterway and ground surface below.

#### **6-07.3(2)C Testing and Disposal of Containment Waste**

Containment waste is defined as all paint chips and debris removed from the steel surface, and all abrasive blast media, as contained by the containment system. After all waste from the containment structures has been collected, the Contractor shall have a minimum of 3 samples of the wastes tested by an accredited analytical Laboratory. Each sample shall be taken from a different storage container unless directed otherwise by the Engineer.

The debris shall be tested for metals using the Toxicity Characteristics Leaching Procedure (TCLP), EPA Methods 1311 and 6010. At a minimum, the materials to be analyzed shall include Arsenic, Barium, Cadmium, Chromium Coppers, Lead, Mercury, Nickel, Selenium, Silver and Zinc.

If the average of the tested samples is at or above all threshold limits as stated in the Dangerous Waste Regulation, Chapter 173-303 WAC, the containment waste will be designated as “Dangerous Waste” and shall be disposed of at a permitted hazardous waste repository. If the average of the tested samples is below the threshold limits, the containment waste will be designated as “Solid Waste” and shall be disposed at a permitted sanitary landfill that will accept the waste. Disposal shall be in accordance with Chapter 173-303 WAC for waste designated “Dangerous Waste” or “Extremely Hazardous Waste” and in accordance with Chapter 173-304 WAC for waste designated as “Solid Waste”.

The Contractor shall supply 2 copies of the transmittal documents or bill of lading listing the waste material shipped from the construction site to the waste disposal site. One copy of the shipment list shall show the signature of the Engineer and shall have the waste site operator’s confirmation for receipt of the waste.

In the event that the containment wastes are designated as “Dangerous Wastes” or “Extremely Hazardous Waste” under Chapter 173-303 WAC, the Contracting Agency will provide to the Contractor the appropriate EPA identification number.

Unless noted otherwise a waste site will not be provided by the Contracting Agency for the disposal of excess materials and debris.

#### **6-07.3(2)D Drip Tarps**

During painting operations the Contractor shall furnish, install, and maintain drip tarps below the areas to be painted to contain all spilled paint, buckets, brushes, and other deleterious material, and prevent such materials from reaching the environment below the bridge. Drip tarps shall be absorbent material and hung to minimize puddling.

The Contractor shall submit to the Engineer for approval, a proposed method for hanging the drip tarps below the paint platforms and connecting them to the bridge, in accordance with Section 6-01.9. After the Contractor has completed painting of the Structure, the drip tarps and all connecting hardware shall be removed from the project.

At the pre-construction conference, the Contractor shall submit to the Engineer for approval, a written detailed method for the removal of any accidental spills or drips on traffic that occur during the normal painting operations. A vehicle cleaning station shall be provided.

At the pre-construction conference, the Contractor shall designate, in writing, a supervisory employee of the Contractor who will be on the project at all times and will be fully responsible for taking the required corrective action should any paint damage occur.

#### **6-07.3(2)E Sampling and Testing**

The Contractor shall provide the Engineer the following materials and information for testing:

1. One quart of each coating material and of each thinner for testing of each batch or lot that is sampled at the factory at the time of containerizing. The Contracting Agency may, at its discretion, place an Inspector at the site of manufacture.
2. A manufacturer's certificate certifying the test results for each batch of each coat. In addition, if the coating is specified for use on a steel contact surface, the certificate shall certify that the coating material meets the requirements for coefficient of friction.
3. A Product Data Sheet for each coating material and thinner.
4. A Material Safety Data Sheet with the initial sample for each type of coating material and thinner.
5. If the quantity of paint required for each component of the coating system is 20-gallons or less, Item 1 will not apply, and the coating system components will be accepted based on the manufacturer's notarized statement as specified in Section 9-08.3 along with copies of Items 2, 3, and 4.

The following tests will be used to insure that the coating materials meet the requirements of the Specifications.

<b>Test</b>	<b>Test Method</b>
Weight-Per-Gallon Determination of Paints and Coatings	ASTM D 1475
Determination of Zinc Dry Films of Paints and Coatings	ASTM D 2371
Coarse Particles in Pigments, Pastes, and Paints	ASTM D 185
Consistency of Paints Using the Stormer Viscometer	ASTM D 562
Fineness of Dispersion of Pigment-Vehicle Systems	ASTM D 1210
Drying, Curing, of Film Formation of Organic Coatings at Room Temperatures	ASTM D 1640
Volatile Content of Paints	ASTM D 2369
Pigment Content of Solvent-Type Paints	ASTM D 2371
Infrared Identification of Vehicle	
Solids From Solvent-Type Paints	ASTM D 2621
Volume Nonvolatile Matter in Clear or Pigmented Coatings	ASTM D 2697
Vehicle Solids (Ordinary Centrifuge)	FTMS 141 Method 4051
Nonvolatile Vehicle Content	FTMS 141 Method 4053



Sampling and testing performed by the Contracting Agency shall not be construed as determining or predicting the performance or compatibility of the individual coating material, or the completed coating system.

The Contractor shall furnish to the Engineer 5-gallons of finish coat paint in the appropriate color specified in the Special Provisions as a part of this Contract. The paint container shall be marked to show the lot number, bridge number and paint name and color number.

#### **6-07.3(2)F Preparing Paint Materials for Use**

Coating materials will be rejected if:

- a) The material arrives at the application site in other than the original, unopened containers.
- b) The container has a break in the lid seal or a puncture.
- c) The coating material has begun to polymerize, solidify, gel, or deteriorate in any manner.
- d) The recommended shelf life, as stated on the manufacturer's product data sheets, has expired.
- e) A skin forms on the surface of the material or on the sides of the container and the volume of the skin exceeds 2-percent of the material. If there is not more than 2-percent skin, the Contractor shall remove and discard only the skin.

#### **Mixing**

The Contractor shall thoroughly mix coating materials by mechanical means to ensure a uniform composition. Coating materials shall not be mixed by means of air stream bubbling or boxing. Coating materials shall be mixed in the original containers and mixing shall continue until all pigment or metallic powder is in suspension. Care shall be taken to ensure that the solid coating material that has settled to the bottom of the container is thoroughly dispersed. After mixing, the Contractor shall inspect the coating materials for uniformity and to ensure that no unmixed pigment or lumps are present.

Catalysts, curing agents, hardeners, initiators, or dry metallic powders which are packaged separately shall be added to the base coating material only after the base coating material is thoroughly mixed to achieve a uniform mixture with all particles wetted. The Contractor shall then add the proper volume of curing agent to the correct volume of base and mix thoroughly. The mixture shall be used within the pot life specified by the manufacturer. Unused portions shall be discarded at the end of each work day.

#### **Thinning**

The Contractor shall not add additional thinner at the application site except as approved by the Engineer. The amount and type of thinner, if allowed, shall conform to the manufacturer's Specifications.

#### **Application Site Tinting**

Application site tinting will not be allowed except as approved by the Engineer.

#### **Agitators**

When recommended by the manufacturer, the Contractor shall constantly agitate coating materials during application by use of paint pots equipped with mechanical agitators.

**6-07.3(2)G Painting Steel Surfaces**

The coating system for all steel surfaces shall incorporate 3 single component moisture-cured polyurethane coats. The first component shall be the primer coat, Standard Formula A-11-99. This coat shall be used as a spot coat in areas that are cleaned down to bare metal. The second coat shall be Standard Formula B-11-99 and third coat shall be Standard Formula C-11-99. The second and third coats shall encapsulate the entire Structures.

In addition to the requirements of the Specifications, coating applications shall conform to:

- a) The best practices of the trade.
- b) The written recommendations of the coating manufacturer.
- c) All applicable portions of the SSPC-PA1.

No primer paint shall be applied to any surface until the surface has been inspected and approved by the Engineer. Any area to which primer paint has been applied without the Engineer's inspection and approval will be considered improperly cleaned. The unauthorized application shall be completely removed and the entire area recleaned to the satisfaction of the Engineer. After the area has been recleaned, inspected, and approved, the Contractor may again initiate the painting sequence.

No additional compensation or extension of time in accordance with Section 1-08.8 will be allowed for the removal of any unauthorized paint application and recleaning of the underlying surface.

**Surface Condition**

The surface to be covered with a coating shall be free of dust, grease, or other substance that would prevent the bond of the succeeding application. The Contractor shall protect freshly coated surfaces from contamination by abrasives, dust, or foreign materials from any other source. The Contractor shall prepare contaminated surfaces to the satisfaction of the Engineer before applying another coat.

**Application Methods**

The Contractor shall apply coating materials by air or airless spray, brush, roller, any combination of these methods, or as recommended by the coating material manufacturer, unless otherwise specified. All application techniques shall conform to Section 7, SSPC-PA 1.

Each coat shall be applied in a uniform layer, completely covering the preceding coat. Individual coats shall be tinted a sufficiently different shade so that each coat can be easily detected. The Contractor shall correct runs, sags, skips, or other deficiencies before application of succeeding coats. Such corrective Work may require recleaning, application of additional coating, or other means as determined by the Engineer at no additional cost to the Contracting Agency.

Painters, using brushes, shall Work from pails containing a maximum of 2-gallons of paint. This is intended to minimize the impact of any spill.

Paint shall be stored and mixed in a secure, contained location to eliminate the potential for spills into State waters, and onto the ground and Highway surfaces.

**Environmental Conditions**

Apply coating materials only during periods when:

1. Air temperature is above 35°F.
2. Steel surface temperature is between 35°F and 115°F.
3. Steel surface does not show wet drops and is not wet.
4. Relative humidity is within the manufacturer's recommended range.

Application will not be allowed if the Engineer determines that conditions are not favorable for proper application and performance of the coating.

During painting operations the area below the bridge shall be protected with a drip tarp as specified in Section 6-07.3(2)D.

If fresh coatings are damaged by the elements, the Contractor shall replace or repair the coating to the satisfaction of the Engineer at no additional cost to the Contracting Agency.

Cleaning of equipment shall not be done in State waters nor shall resultant cleaning runoff be allowed to enter State waters. No paint cans, lids, brushes, or other debris shall be allowed to enter State waters.

Solvents, paints, paint sludge, cans, buckets, rags, brushes, and other waste associated with this project shall be collected and disposed of off site.

Paint products, petroleum products or other deleterious material shall not be wasted into, or otherwise enter, State waters as a result of project activities.

#### **Application of Coatings**

After applying the spot prime coat to all areas cleaned to bare metal and before applying the intermediate coat, the Contractor shall apply a stripe coat on all edges, corners, seams, crevices, interior angles, junction of joint members, rivet or bolt heads, nuts and threads, weld lines, and any similar surface irregularities. The stripe coat shall be the same formula as the intermediate coat. The stripe coat shall be of sufficient thickness to completely hide the surface being covered and shall be followed as soon as practical by the application of intermediate coat to its specified thickness. All stripe coats shall be done by brush.

If the spot prime coat leaves unsealed cracks or crevices, these shall be sealed with single component urethane sealant meeting the requirements of Federal Specification TT-S-00230C, Type II, Class A (applied per the manufacturer's recommendation) before the intermediate coat is applied.

Coating thickness measurements will be made by the Engineer after the application of each coat and before the application of the succeeding coat. In addition, the Engineer will inspect for uniform and complete coverage and appearance. One hundred-percent of all thickness measurements shall be the minimum wet film thickness specified in Section 6-07.3(5). If thickness measurements or visual inspection of coverage do not meet the specified minimum, the Contractor shall make additional applications, as necessary, to achieve thickness and coverage requirements.

In areas where wet film thickness measurements are impractical, dry film thickness measurements will be made using magnetic dry film thickness gauges as specified in Section 6-07.3(5).

If a question arises about an individual coat thickness or coverage, it will be verified by the use of a Tooke gage. If the Tooke gage shows a coat thickness to be less than a minimum dry film thickness of 3.0-mils or indicates a missing intermediate coat, the total coating system will be rejected, even if the thickness of the total system equals or exceeds the total thickness specified.

If Roadway or sidewalk planks lie so close to the metal that they prevent proper cleaning and painting, the Contractor shall remove or cut the planks to provide at least a 1-inch clearance. Any plank removal or cutting shall be done as approved by the Engineer. The Contractor shall replace all planks after painting. If removal breaks or damages the planks and makes them unfit for reuse, the Contractor shall replace them at no expense to the Contracting Agency.

### **6-07.3(3) Painting Timber Structures**

#### **6-07.3(3)A Number of Coats and Color**

Unless the Plans state otherwise:

1. Rails and rail posts on timber bridges shall receive 2 coats (with the wheel guard painted only on its top edge and Roadway side).
2. Other timber Work shall receive 3 coats (if the Plans or Special Provisions require it to be painted).

Paint color shall be as the Plans, Special Provisions, or Engineer may require.

#### **6-07.3(3)B Application**

As it is painted, any wood surface must be thoroughly dry and free from oil and dirt. Paint shall be applied by brush, spread evenly, and worked thoroughly into all seasoning cracks, corners, and recesses. No later coat shall be applied until the full thickness of the previous coat has dried.

Final brush strokes with aluminum paint shall be made in the same direction to ensure that powder particles “leaf” evenly.

If a painted surface has been stained by creosote nearby, it shall be given 1 or more coats of an approved shellac before repainting.

#### **6-07.3(3)C Painting Treated Timber**

Timber treated with creosote or oil-borne, pentachlorophenol preservatives shall normally not be painted.

Timber treated with water-borne preservatives shall be clean and be reduced to no more than 18-percent moisture content before it is painted. Any visible salt crystals on the wood surface shall be washed and brushed away — with the moisture content reduced again to the specified level before painting. Stored timber awaiting painting shall be covered and stacked with spreaders to ensure air circulation.

### **6-07.3(4) Painting Galvanized Surfaces**

All galvanized surfaces specified to be painted shall be prepared for painting in accordance with the ASTM D 2092. The method of preparation shall be as agreed upon by the paint manufacturer and the galvanizer. The Contractor shall not begin painting until receiving the Engineer’s approval of the prepared galvanized surface.

#### ***Environmental Conditions***

Steel surfaces shall be:

- Greater than 35°F and
- Less than 115°F

or per the manufacturer’s recommendations, whichever is more stringent.

The Contractor shall paint the dry surface as follows:

Paint Formulas		Type
First Coat	MIL-P-24441	Epoxy polyamide
Second Coat	C-11-99	Moisture Cured Aliphatic Polyurethane

Each coat shall be dry before the next coat is applied. All coats applied in the shop shall be dried hard before shipment.

#### **6-07.3(5) Paint — Film Thickness**

The paint film thickness for the paint system of Section 6-07.3(1) shall be as follows. The dry film thickness of the primer coat on the faying surfaces and on the top flanges where the welded shear connectors have been attached shall not be less than 2.5-mils nor greater than 3.5-mils. On all other areas, the minimum dry film thickness for the primer coat shall be 2.5-mils. The minimum dry film thickness for the intermediate coat shall be 3.5-mils. The minimum dry film thickness for the top coat shall be 1.0-mils.

The paint film thickness for the paint system of Section 6-07.3(2) shall be as follows. The minimum wet film thickness of each coat (primer, intermediate, and finish) shall be 6.0-mils.

If the Contract calls for the use of Formula A-5-61, the dry film thickness shall be between 0.4 and 0.7-mils. (The rapid solvent release in this vinyl pretreatment makes it difficult to measure wet film thickness.)

Any other finish, no matter how applied, shall have a wet thickness of at least 6.0-mils per coat and a dry film thickness of at least 3.0-mils per coat.

If the specified number of coats do not produce a combined dry film thickness of at least the sum of the thicknesses required per coat, the Contractor shall apply another full coat of finish paint.

Film thickness — wet and dry — will be measured by suitable gauges. The dry film thickness will be determined by the use of a magnetic or magnetic flux dry film thickness gauge. The gauge shall be calibrated on the blasted steel with plastic shims the same thickness as the minimum dry film thickness. Wet measurements will be taken immediately after the paint is applied, and dry measurements after the coat is dry and hard.

#### **6-07.3(6) Protection of Public and Private Property**

The Contractor shall protect public and private property, traffic, and other parts of the bridge (deck, sidewalks, etc.) from airborne or dripping paint. The Contractor shall supply and install enough canvas or other covering to provide this protection as painting proceeds. If the covering does not adequately protect traffic, the Engineer may require the Contractor to station lookouts who shall stop the painting while vehicles or pedestrians pass.

#### **6-07.4 Measurement**

No specific unit of measurement will apply to the lump sum price for cleaning and painting existing steel Structures.



**6-07.5 Payment**

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

“Cleaning and Painting - \_\_\_\_\_”, lump sum.

The lump sum Contract price for “Cleaning and Painting - \_\_\_\_\_” shall be full pay for all cost in connection with furnishing and placing all necessary staging and rigging, providing material, labor, tools, and equipment, collection and storage of containment waste, collection, storage, testing, and disposal of all containment waste not conforming to the definition in [Section 6-07.3\(2\)C](#), performing all cleaning and preparation of surfaces to be painted and applying all coats of paint and sealant.

“Containment of Abrasives”, lump sum.

The lump sum Contract price for “Containment of Abrasives” shall be full payment for all costs incurred by the Contractor in complying with the requirements as specified in Section 6-07.3(2)B to design, construct, maintain, and remove containment systems for abrasive blasting operations.

“Testing and Disposal of Containment Waste”, by force account as provided in Section 1-09.6.

All costs in connection with testing containment waste, transporting containment waste for disposal, and disposing of containment waste in accordance with [Section 6-07.3\(2\)C](#) will be paid by force account in accordance with [Section 1-09.6](#). For the purpose of providing a common Proposal for all Bidders the Contracting Agency has entered an amount for the item “Testing and Disposal of Containment Waste” in the Bid Proposal to become part of the total Bid by the Contractor.

Payment for painting new steel Structures and timber Structures will be in accordance with Sections 6-03.5 and [6-04.5](#), respectively.